

WHAT IS CLAIMED IS:

- 1 1. A system for managing clock adjustment in a storage system,
2 comprising:
3 a clock configured to provide a current time, wherein the current time is used
4 to enforce a content retention period;
5 control logic configured to receive a proposed new time for the clock;
6 control logic configured to determine whether the proposed new time is
7 reasonable; and
8 control logic configured to adjust the current time of the clock to the proposed
9 new time if it is determined that the proposed new time is reasonable.
- 1 2. The system of claim 1 further comprising:
2 control logic configured to prevent adjustment of the clock to the proposed
3 new time if it is determined that the proposed new time is unreasonable.
- 1 3. The system of claim 1 wherein the control logic configured to
2 determine whether the proposed new time is reasonable further comprises:
3 control logic configured to determine whether the proposed new time falls
4 within a specific range;
5 wherein if the proposed new time falls within the specific range, the proposed
6 new time is determined to be reasonable.
- 1 4. The system of claim 3 wherein the specific range is stored in a
2 memory.
- 1 5. The system of claim 3 further comprising:
2 control logic configured to calculate the specific range.
- 1 6. The system of claim 5 wherein the specific range is calculated using a
2 statistical method.
- 1 7. The system of claim 3 wherein the control logic configured to
2 determine whether the proposed new time falls within the specific range further comprises:
3 control logic configured to calculate a first difference between the proposed
4 new time and the current time provided by the clock;

5 control logic configured to calculate a second difference between the current
6 time provided by the clock and a last adjustment time, the last adjustment time representing
7 the time which the clock was last adjusted;
8 control logic configured to select the specific range based on the second
9 difference; and
10 control logic configured to compare the first difference and the specific range;
11 wherein if the first difference is less than or equal to the specific range, the
12 proposed new time is determined to be reasonable.

1 8. A storage system comprising:
2 a clock configured to provide a current time, wherein the current time is used
3 to enforce a content retention period;
4 a memory configured to store clock management information; and
5 a storage access program configured to:
6 receive a proposed new time for the clock;
7 determine whether the proposed new time is reasonable using the clock
8 management information; and
9 adjust the current time of the clock to the proposed new time if it is
10 determined that the proposed new time is reasonable.

1 9. The storage system of claim 8 wherein the storage access program is
2 further configured to prevent adjustment of the clock to the proposed new time if it is
3 determined that the proposed new time is unreasonable.

1 10. The storage system of claim 8 wherein the storage access program is
2 further configured to determine whether the proposed new time falls within a specific range;
3 and
4 wherein if the proposed new time falls within the specific range, the proposed
5 new time is determined to be reasonable.

1 11. The storage system of claim 10 wherein the clock management
2 information includes a table having a plurality of maximum adjustable time ranges; and
3 wherein the specific range is selected from the plurality of maximum
4 adjustable time ranges.

1 12. The storage system of claim 11 wherein the plurality of maximum
2 adjustable time ranges are calculated using a statistical method.

1 13. The storage system of claim 11 wherein the clock management
2 information further includes a last adjustment time, the last adjustment time representing the
3 time that the clock was last adjusted; and

4 wherein the storage access program is further configured to determine whether
5 the proposed new time is reasonable using the last adjustment time, the current time and the
6 specific range.

1 14. The storage system of claim 13 wherein the storage access program is
2 further configured to:

3 calculate a first difference between the proposed new time and the current
4 time;

5 calculate a second difference between the current time and the last adjustment
6 time; and

7 select the specific range from the plurality of maximum adjustable time ranges
8 based on the second difference; and

9 compare the first difference and the specific range to determine whether the
10 proposed new time is reasonable;

11 wherein if the first difference is less than or equal to the specific range, the
12 proposed new time is determined to be reasonable.

1 15. The storage system of claim 10 wherein the storage access program is
2 further configured to calculate the specific range.

1 16. A storage system comprising:

2 a clock configured to provide a current time, wherein the current time is used
3 to enforce a content retention period;

4 a memory configured to store clock management information, wherein the
5 clock management information includes a last adjustment time and a plurality of maximum
6 adjustable time ranges, wherein the last adjustment time represents the time which the clock
7 was last adjusted; and

8 a storage access program configured to:

9 receive a proposed new time for the clock;

10 determine whether the proposed new time is reasonable using the
11 current time, the last adjustment time and a specific range selected from the plurality of
12 maximum adjustable time ranges; and
13 adjust the current time of the clock to the proposed new time if it is
14 determined that the proposed new time is reasonable.

1 17. The storage system of claim 16 wherein the storage access program is
2 further configured to prevent adjustment of the clock to the proposed new time if it is
3 determined that the proposed new time is unreasonable.

1 18. The storage system of claim 16 wherein the storage access program is
2 further configured to:
3 calculate a first difference between the proposed new time and the
4 current time;
5 calculate a second difference between the current time and the last
6 adjustment time; and
7 select the specific range from the plurality of maximum adjustable time
8 ranges based on the second difference;
9 wherein if the first difference is less than or equal to the specific range, the
10 proposed new time is determined to be reasonable.

1 19. The storage system of claim 16 wherein the plurality of maximum
2 adjustable time ranges are calculated using a statistical method.

1 20. A method for managing clock adjustment in a storage system, the
2 storage system having a clock providing a current time for enforcing a content retention
3 period, comprising:
4 receiving a proposed new time for the clock;
5 determining whether the proposed new time is reasonable; and
6 adjusting the current time of the clock to the proposed new time if it is
7 determined that the proposed new time is reasonable.

1 21. The method of claim 20 further comprising:
2 preventing adjustment of the clock to the proposed new time if it is determined
3 that the proposed new time is unreasonable.

1 22. The method of claim 20 wherein determining whether the proposed
2 new time is reasonable further comprises:
3 determining whether the proposed new time falls within a specific range;
4 wherein if the proposed new time falls within the specific range, the proposed
5 new time is determined to be reasonable.

1 23. The method of claim 22 further comprising:
2 calculating the specific range.

1 24. The method of claim 23 wherein the specific range is calculated using
2 a statistical method.

1 25. The method of claim 22 wherein determining whether the proposed
2 new time falls within the specific range further comprises:
3 calculating a first difference between the proposed new time and the current
4 time provided by the clock;
5 calculating a second difference between the current time provided by the clock
6 and a last adjustment time, the last adjustment time representing the time which the clock was
7 last adjusted;
8 selecting the specific range based on the second difference; and
9 comparing the first difference and the specific range;
10 wherein if the first difference is less than or equal to the specific range, the
11 proposed new time is determined to be reasonable.

1 26. A method for managing clock adjustment in a storage system, the
2 storage system having a clock configured to provide a current time, wherein the current time
3 is used to enforce a content retention period, and a memory configured to store clock
4 management information, the method comprising:
5 receiving a proposed new time for the clock;
6 determining whether the proposed new time is reasonable using the clock
7 management information; and
8 adjusting the current time of the clock to the proposed new time if it is
9 determined that the proposed new time is reasonable.

1 27. The method of claim 26 further comprising:

2 preventing adjustment of the clock to the proposed new time if it is determined
3 that the proposed new time is unreasonable.

1 28. The method of claim 26 wherein determining whether the proposed
2 new time is reasonable includes:
3 determining whether the proposed new time falls within a specific range; and
4 wherein if the proposed new time falls within the specific range, the proposed
5 new time is determined to be reasonable.

1 29. The method of claim 28 wherein the clock management information
2 includes a table having a plurality of maximum adjustable time ranges; and
3 wherein the specific range is selected from the plurality of maximum
4 adjustable time ranges.

1 30. The method of claim 29 wherein the plurality of maximum adjustable
2 time ranges are calculated using a statistical method.

1 31. The method of claim 29 wherein the clock management information
2 further includes a last adjustment time, the last adjustment time representing the time that the
3 clock was last adjusted; the method further comprising:
4 using the last adjustment time, the current time and the specific range to
5 determine whether the proposed new time is reasonable.

1 32. The method of claim 31 further comprising:
2 calculating a first difference between the proposed new time and the current
3 time;
4 calculating a second difference between the current time and the last
5 adjustment time; and
6 selecting the specific range from the plurality of maximum adjustable time
7 ranges based on the second difference; and
8 comparing the first difference and the specific range to determine whether the
9 proposed new time is reasonable;
10 wherein if the first difference is less than or equal to the specific range, the
11 proposed new time is determined to be reasonable.

1 33. A method for managing clock adjustment in a storage system, the
2 storage system having a clock providing a current time for enforcing a content retention
3 period, comprising:

4 receiving a proposed new time for the clock; and
5 adjusting the current time of the clock to the proposed new time if the
6 proposed new time falls within a specific range.

1 34. The method of claim 33 further comprising:
2 preventing adjustment of the clock to the proposed new time if the proposed
3 new time does not fall within the specific range.